Conveyor belt with ball-type reinforcement on the bearing side

Specification

The invention relates to a conveyor belt having a bearing side and a backing side made of elastomer material, as well as an embedded reinforcement carrier, particularly in the form of steel cables or steel cords, or a one-layer or multi-layer reinforcement carrier. In this regard, reference is made to the following prior art, for example: DE 25 32 190 C2, DE 38 01 120 C2, DE 37 35 024 A1, and DE 38 02 963 A1.

Within the scope of a further development, the task consists in making available a conveyor belt having an improved impact protection or cut protection.

This task is accomplished by means of the characterizing part of claim 1, in that the bearing side is reinforced with ball-type elements.

Practical embodiments of the invention are indicated in claims 2 to 20.

The invention will now be described on the basis of an exemplary embodiment, making reference to a drawing that shows the cross-section of a conveyor belt.

The conveyor belt 1 comprises a bearing side 2 and a backing side 3, which consist of an elastomer material, in each instance. The conveyor belt furthermore has an embedded reinforcement carrier 4 in the form of steel cables.

The bearing side 2 is reinforced with ball-type elements 5 that are disposed within a single layer 6. This layer, in the form of an elastomer matrix, runs close to the reinforcement carrier 4, whereby the ball-type reinforcement extends essentially over the entire width of the conveyor belt. Furthermore, the ball-type elements have essentially the same diameter, whereby the diameter of the ball-type elements corresponds approximately to the layer thickness.

The particular feature of this bearing side 2 reinforced by ball-type elements 5 lies in the round surface of the ball-type elements that are introduced, which deflect a penetrating foreign body, for one thing, i.e. also "brake" it,

and for another thing, they counteract a possible notch effect on the opposite side of where the damage occurs. Any damage that has occurred within the bearing side by way of these ball-type elements will not continue to grow (tear further) with this damage geometry, at the same speed, as is the case in a conventional, non-reinforced bearing side. Therefore, damage growth prevention is connected with this new concept.

The bearing side, reinforced with ball-type elements, is also referred to as a damping ball-type element mat.

The following tables state the practical diameter and density range of the ball-type elements and the elastomer densities, in Table 1, on the one hand, as well as concrete experimental data within these ranges in Table 2, on the other hand.

Table 1

Ball-type elements			Elastomer density [g/cm^3] (reinforcement layer)
Material	Diameter [mm]	Density [g/cm^3]	
Steel	1-5	7.5-8.7	1.1-1.6
PUR	1-5	1.18-1.24	1.1-1.6
Aluminum	1-5	2.7	1.1-1.6
Glass	1-5	2.6	1.1-1.6
Lead	1-5	11.4	1.1-1.6
POM	1-5	1.41-1.43	1.1-1.6

Table 2

Ball-type elements			Elastomer density [g/cm^3] (reinforcement layer)
Material	Diameter [mm]	Density [g/cm^3]	
Steel	1	8.0	1.1
Steel	5	8.0	1.1
PUR	1	1.2	1.1
PUR	5	1.2	1.1
Lead	5	11.4	1.1
Lead	5	11.4	1.6

The thickness of the reinforcement layer corresponded to the diameter of the ball-type elements in all the experiments.

Reference Symbol List

1 conveyor belt

2 bearing side (cover plate on bearing side)

3 backing side (cover plate on backing side)

4 reinforcement carrier (steel cables)

5 ball-type elements

6 layer of the ball-type elements (reinforcement layer)